(71) Applicant
Bally Manufacturing
Corporation
2640 Belmont Avenue
Chicago
State of Illinois 60618
United States of
America
(72) Inventors
Martin A Keane
Joseph E Lally
(74) Agents
Bould Wade & Tennant
27 Furnival Street
London EC4A 1PQ

(54) **Swap feature for fruit machines**

(57) A swap feature is added to fruit machines to enable a player to exert partial control over reels 12. When the feature is enabled, as may be indicated by a light 15, the player has the option of depressing a swap button 21 on the machine. When the button is depressed, the symbols 17 displayed by two of the reels of the machine will appear to be interchanged. Alternatively, the symbol on a stopped reel will appear on a spinning reel, which is stopped, whereas the original stopped reel will recommence spinning. The feature is implemented through microcomputer control of means for starting and stopping reels. The microcomputer 10 is provided with the instantaneous digitized angular position of each reel by sensing means.
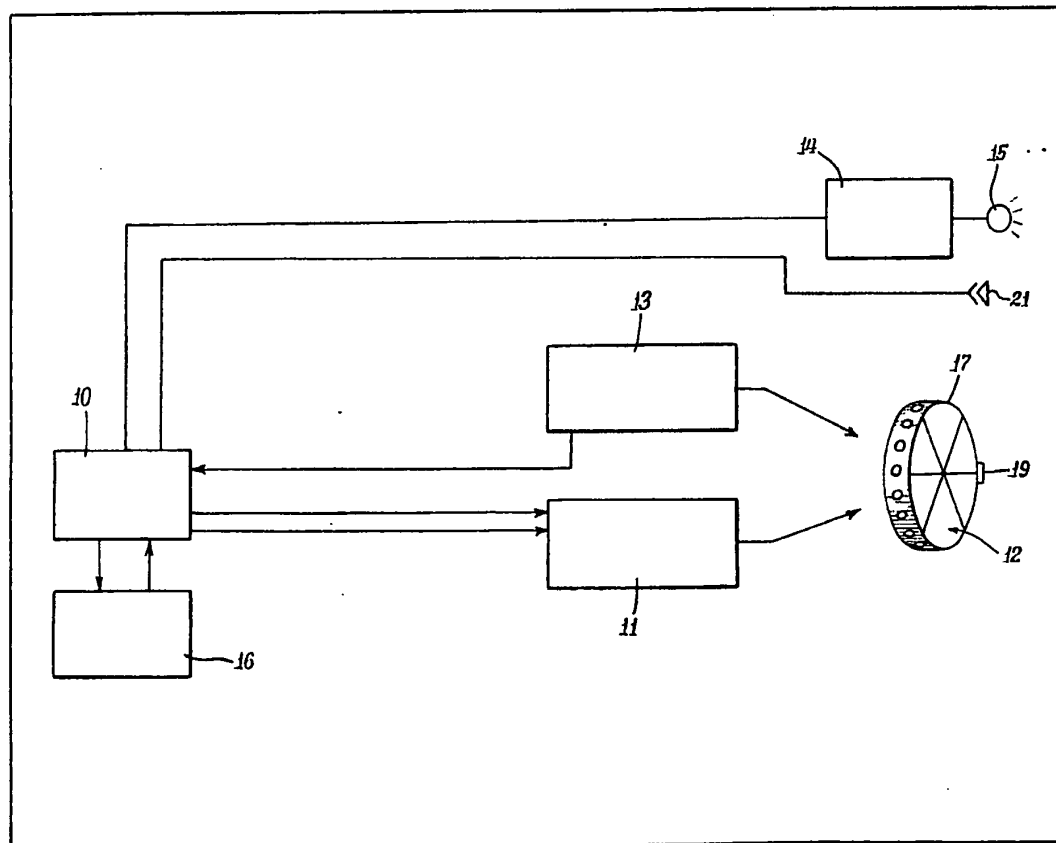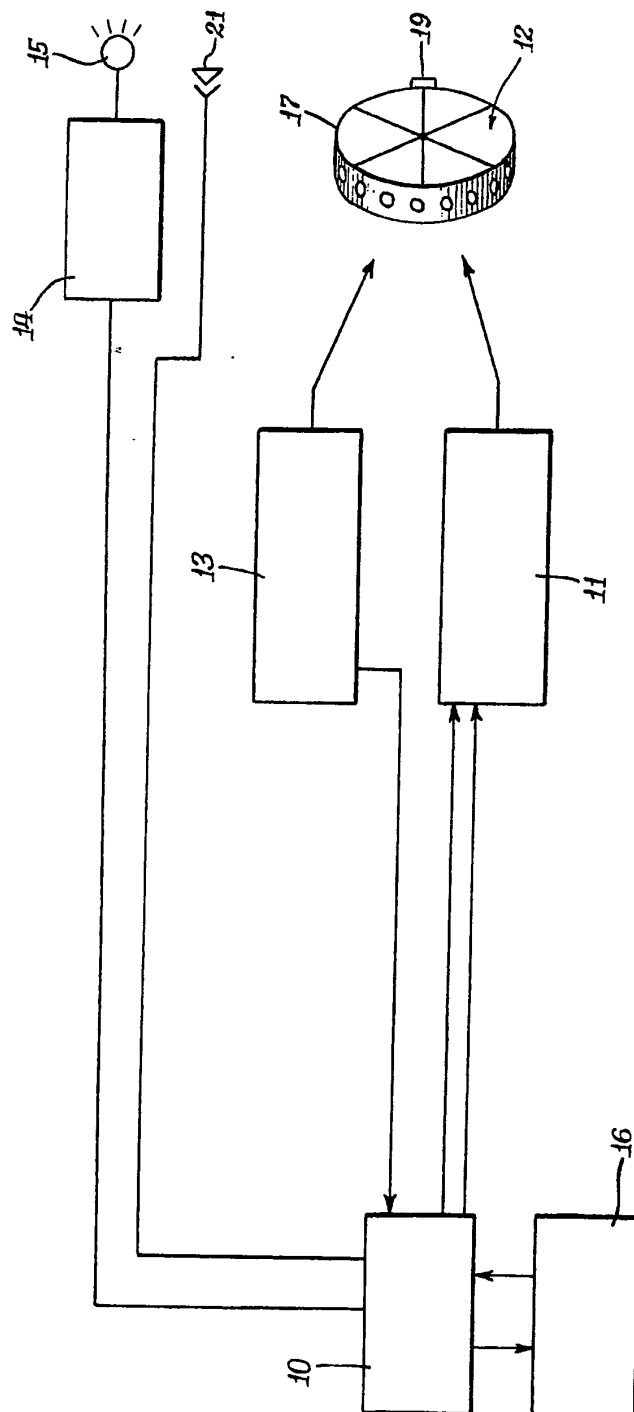
The drawing originally filed was informal and the print here reproduced is taken from a later filed formal copy.

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SPECIFICATION

Swap feature for fruit machines

5 This invention relates to a gaming machine or amusement-with-prize machine of the type generally known as a fruit (or slot) machine. The machine will ordinarily comprise a plurality of reels with symbols displayed on the

10 periphery. The reels all have approximately common axes, or at least approximately parallel axes. At the periphery of each reel is a window capable of displaying one or more symbols at one time, but typically, three sym-

15 bols are displayed. The reels are controlled by means which can cause them to rotate and to stop independently. Certain combinations of symbols shown on the stopped reels, as is well known, are accorded status as winning

20 combinations. Selection of one symbol from each reel according to a predetermined rule defines a "win line". The winning combination must be on the win line.

In the typical fruit machine the reels are

25 caused to rotate by a player who deposits a coin and then pulls a lever. The reels then stop under the influence of inertia or other means, the stopping positions being random. A disadvantage of the prior art fruit machines

30 is that once a player has pulled the lever and sets the reels in motion he has no further control over the course of the game. The advent of an economical microprocessor technology has now made it feasible to consider

35 variants of the traditional fruit machines.

The present invention has to do with a microprocessor based "swap" feature which enables a player under certain conditions to improve the value of the combination dis-

40 played to him and thereby increase his chance of winning. A feature of the present embodiment of the invention is the provision of a means whereby the player may "swap" or trade the symbols on the win line between

45 pairs of reels to improve his combination.

According to the invention there is provided a gaming device having a plurality of reels, each reel bearing symbols on its periphery with means for simultaneously displaying a

50 single symbol from each reel on a win line when all the reels are stopped, the gaming device, including a swap feature comprising a control means for randomly enabling the swap feature, indicating to players that the swap

55 feature is enabled, and initiating the starting and stopping of each reel in the play of the game; a driving means for independently starting and stopping the rotation of each reel; a sensing means for sensing the instantaneous

60 position of each reel; and a swap means which a player activates to indicate to the control means that he desires to exchange symbols displayed by a pair or reels; so that when the swap feature is enabled by the

65 control means and the player activates the swap means, the control means then activates the means for starting and stopping the pair of reels, continuously sensing the instantaneous position of each reel, to cause the pair of

70 reels to rotate and stop as though they had been interchanged.

In a first embodiment of the invention the player faces three windows that comprise the possibly winning combination and a fourth, or

75 auxiliary window that is not counted in determining whether the combination is a winning one. A light labelled "swap" indicates whether the swap feature is enabled. Enabling may be done on a random basis with some

80 predetermined fraction of combinations shown on the stopped reels. Enabling may also be for a limited time in some embodiments. Typically, the enabling of swap would occur about 10 percent of the time.

85 The player is provided with a button on the face of the machine whereby he may implement the "swap" feature. If he implements the "swap" feature during the time the feature is enabled, then the symbol on the fourth

90 reel will be interchanged with the corresponding symbol on one of the other reels.

In a second embodiment the symbols displayed in all the windows are counted in determining whether or not the combination is

95 a winning combination. Swap buttons are placed, for example, between each pair of reels. When the reels have stopped during a play of the game the "swap" feature may or may not be enabled for a limited period of

100 time according to some random probabilistic choice. During the time that the "swap" feature is enabled the player may implement a swap between two adjacent reels by activating a swap button between those reels. As a

105 result of activating the button the symbols on the adjacent reels will be interchanged.

It is understood that many variants of the two embodiments described fall within the scope of the present invention. It is not neces-

110 sary, for example, that the reels stop simultaneously, nor that swap be enabled only after the reels are all stopped. It is also not necessary that the reels all stop simultaneously. In other embodiments falling within the scope of

115 the present invention the reels may stop according to a random sequence and the "swap" feature then randomly enabled for short periods of time between a stopped reel and an adjacent or other reel that is still

120 spinning. Activation of the swap button in such case would stop the spinning reel so that it exhibits the symbol shown on the stopped reel and at the same time would start the stopped reel spinning again so that it will

125 eventually stop, showing a possibly new symbol. Persons who are skilled in the use of microprocessors and the design of gaming machines will recognise that other embodiments are possible, all falling within the scope

130 of the present invention.

The invention will now be described by way of example with reference to the accompanying drawing.

Figure 1 is a diagrammatic illustration of
5 the components of a preferred embodiment constructed in accordance with the principles of the present invention.

Specific constructions of the various embodiments described herein and of other conceiv-
10 able embodiments will utilise means for controlling the reels such as those exhibited schematically in Fig. 1. The underlying principle of the "swap" feature is that the symbols are interchanged by causing each reel to rotate
15 rapidly to the new symbol. Thus, if two adjacent reels exhibited a cherry and a pear, respectively, and a "swap" were implemented between the two reels, then the reel showing a cherry would rotate rapidly and stop exibit-
20 ing a pear, whereas the reel showing the pear would rotate rapidly and stop showing the cherry.

Under microprocessor control the "swap" feature may be realised once the microproces-
25 sor has the capability of starting and stopping a reel at a preset position. Thus, Fig. 1 shows schematically a microprocessor 10 connected to a driving means 11 for controlling rotation of a particular reel 12. The microprocessor
30 will send start and stop signals to the driving means. Such driving means may comprise an electric motor or combinations of motors and clutches and clutches and brakes or other such mechanisms as are well known to per-
35 sons skilled in the art.

Also connected to the reel 12 is a sensing means 13 for detecting the instantaneous reel position. As example of such sensing means is described in the specification of an application
40 for a patent entitled "Analogue Encoder for Slot Machine Reels," which is co-pending with the present application. The sensing means transmits the instantaneous reel position as a digital signal to the microprocessor
45 10 at frequent intervals. The driving means 11 and sensing means 13 thereby provide the microprocessor with means for rotating the reel to any preselected position.

The microprocessor 10 is also connected to
50 a signalling means 14 for energising a "swap" light 15. The "swap" light is energised at times determined by programmes in a ROM and RAM memory 16 associated with the microprocessor.
55 The reel 12 is one of a plurality of similar reels, all typified by the one shown in the figure. Each such reel has symbols 17, such as pictures of different varieties of fruit, on the periphery. The plurality of reels is contained in
60 a housing having a window 19 through which the peripheries of all the reels of the plurality may be seen. The window will ordinarily be of a width just sufficient to show a single fruit symbol and therefore may be considered to be
65 a win line.

The "swap" light 15 will ordinarily be located in the vicinity of the housing containing the plurality of reels such as reel 12. Also near the housing will be at least one "swap"
70 button 21. The "swap" button will cause a signal to be transmitted to the microprocessor 10.

The microprocessor 10 will only be receptive to signals initiated by the "swap" button
75 21 at such times as the "swap" light 15 is energised. Conceptually, therefore, it is only when the swap light is on that the swap feature is enabled.

In one embodiment of the invention the
80 "swap" light will be turned on after all the reels have stopped at the end of one play of the fruit machine game. In this embodiment there may be four reels of which only three are considered in determining whether a win-
85 ning combination is showing. The fourth reel might comprise a "swap" reel. If the "swap" light is on when the four reels have stopped, then the player may be permitted, by depressing the "swap" button, to interchange the
90 symbol showing on the "swap" reel with the symbol on one of the other three reels. The presence of the "swap" feature will thereby enable the player to improve his score from time to time according to the laws of probabil-
95 ity. In a second embodiment of the invention the presence of a winning combination may be determined by the order in which fruit symbols 17 appear in the window 19. A "swap" button 21 placed between a pair of
100 reels such as reel 12, would enable a player to interchange the symbols showing on the pair of reels when the swap feature is enabled at the end of a play. Thus, from time to time the "swap" feature would permit him to im-
105 prove his score.

CLAIMS

1. A gaming device having a plurality of reels, each reel bearing symbols on its periph-
110 ery with means for simultaneously displaying a single symbol from each reel on a win line when all the reels are stopped, the gaming device, including a swap feature comprising a control means for randomly enabling the swap
115 feature, indicating to players that the swap feature is enabled, and initiating the starting and stopping of each reel in the play of the game; a driving means for independently starting and stopping the rotation of each reel;
120 a sensing means for sensing the instantaneous position of each reel; and a swap means which a player activates to indicate to the control means that he desires to exchange the sumbols displayed by a pair of reels; so that
125 when the swap feature is enabled by the control means and the player activates the swap means, the control means then activates the means for starting and stopping the pair of reels, continuously sensing the instantane-
130 ous position of each reel, to cause the pair of

reels to rotate and stop as though they had been interchanged.

2. A swap feature according to Claim 1 wherein said control means only enables said

5 swap feature when both reels of said pair are stopped.

3. A swap feature according to Claim 1 wherein said control means only enables said swap feature when one reel of said pair is

10 stopped and one reel of said pair is rotating.

4. A gaming device substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.